THE LURE OF MEDICAL HISTORY†

MEDICINE IN COLONIAL AMERICA

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PUBLIC HEALTH DURING COLONIAL DAYS

THE early history of the colonies seems, at times, to be an unbroken record of misery, suffering, and death. Added to natural exposures of pioneering and the menace of hostile Indians were disease and pestilence both old and new. When the first settlers established themselves at Jamestown in the delightful time of early spring, they were pleased with the new place which did "well agree with the English constitucions." But at the end of the summer their joy was gone. George Percy, one of the first settlers, wrote as follows: "Our men were destroyed with cruel diseases, as swellings, flixes, burning fevers, and by wars, and some departed suddenly. But for the most part they died of mere famine. There were never Englishmen left in a foreign country in such misery as we were in this new discovered Virginia. We watched every three nights lying on the bare cold ground, what weather soever came; warded all the next day which brought our men to be most feeble wretches. Our food was but a small can of barley sod in water to five men a day; our drink cold water taken out of the river, which was at flood very salt, at a low tide full of slime and filth, which was the destruction of many of our men. Thus we lived for the space of five months in this miserable distress, not having five able men to man our bulwarks upon any occasion. If it had not pleased God to put a terror in the savage's hearts, we had all perished by those wild and cruel pagans, being in that weak estate as we were; our men night and day groaning in every corner of the fort most pitiful to hear. If there were any conscience in men, it would make their hearts bleed to hear the pitiful murmurings and outcries of our sick men, without relief every night and day for the space of six weeks; some departing out of the world, many times three or four in a night, in the morning their bodies trailled out of their cabins like dogs to be buried."

Not markedly different was the plight of New England. Indeed it seemed as if a pestilence among the Indians had been timed to prepare a place for the bold adventurers, for friendly natives told them of a fatal malady that had raged from 1616 to 1620, almost literally destroying the various tribes in the New England country. The nature of this scourge has never been definitely determined.

Into this devastated region the Pilgrims came in December, 1620. After three months but fifty of the one hundred who landed survived. Bradford believed this high death rate due to their "being Infected with ye Scurvie and other diseases, which this long vioage & their Inacomodate condition had brought upon them; so as there dyed some times 2 or 3 of a day, in ye foresaid time."

Probably the most disastrous journey ever made to the New World was the voyage to Virginia, in 1618, of one hundred eighty emigrants from Amsterdam under the leadership of Francis Blackwell, one of the leading Puritans of the city. Before the small, crowded vessel reached Virginia one hundred thirty people, including Blackwell himself, had fallen victims to disease. The *Lion's Whelp,* the vessel on which William Penn made a "short and speedy" passage of six and one-half weeks, lost thirty from smallpox during the voyage.

Scurvy from time immemorial had been the great scourge of people living on the diet of the sea, taking a dread toll in suffering and death. But after surviving the discomforts and perils of the long sea voyage, and settling in the new country, the immigrants were attacked by many and terrible sieges of disease. These troubles were due largely to the weakened condition in which the people arrived, lack of proper food, rigorous climate, and crowded conditions.

SMALLPOX

One of the worst of the afflictions of the colonies was smallpox. Introduced into the West Indies in 1507 by the Spanish and perhaps later brought to the mainland from other parts of Europe as well, smallpox entered into almost every home of the period at one time or another and demanded its heavy share in the mortality list. Because the disease was so general and unremitting, it seems futile to emphasize any particular date; but the records indicate epidemics of more than usual intensity in 1633, 1666, 1668, 1677, 1688, 1690, 1702, and 1721. The first medical publication in North America was a "Brief Rule to guide the Common People of New England, How to order themselves and theirs in the Small Pocks, or Measles," written in 1777 by Thomas Thacher, a clergyman-physician of Boston.

INOCULATION FOR SMALLPOX

In 1721 Lady Mary Wortley Montagu returned to England from Turkey, bringing with her the story of inoculation for smallpox as it was practiced in Constantinople. The English, as a result of her enthusiasm, were led to experiment on condemned criminals and finally on others.

Cotton Mather, in the colonies, read of this new treatment just six weeks after it was introduced in London, and sought the medical aid of Dr. William Douglass, the one physician of Boston's ten at the time who held a degree; but the idea was too novel for Douglass. Cotton Mather did find an able second, however, in Dr. Zabdiel Boylston, who began the actual work of inoculation in America. His first experiment was done on his own son, a boy of thirteen, and two negro servants; but soon the number had grown to 250, and of this number only six died, while in the same period, of 5,759 who took smallpox in the normal manner 844 died.

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But the persecution that followed the introduction of inoculation is unbelievable. The medical men of the city attacked Boylston as a rash, unscrupulous quack, and the press, led by Benjamin Franklin's brother, declared that death from inoculation was murder; the mobs abused Boylston and the Massachusetts legislature drew up a bill to prohibit this obnoxious practice.

The following is a copy of the resolutions passed by the Justices of Peace and Selectmen, called together by the physicians, as reported by Thomas Hutchinson: "That it appears by numerous instances that inoculation has proved the death of many persons soon after the operation, and brought distempers on many others, which in the end have proved deadly to them. That the natural tendency of infusing such malignant filth in the mass of blood is to corrupt and putrify it, and if there be not a sufficient discharge of that malignity, by the place of incision or elsewhere, it lays a foundation for many dangerous diseases. That the continuing the operation among us is likely to prove of the most dangerous consequences."

This radical departure in inoculating was too astounding for the common people; the medical men were bitter in their criticisms, and the ministers besought the wrath of Jehovah against the wicked who were subverting the decrees of Providence and resisting the punishments of God. In 1732 the Reverend Mr. Massey preached from the text of Job ii:7: "So Satan went forth from the presence of the Lord and smote Job with sore boils from the sole of his foot unto his crown," and concluded that "the cutaneous disease of Job was produced by inoculation from the hands of the devil, and the whole art was of infernal invention." Cotton Mather, as the spirit back of the whole trouble, was abused mercilessly; one opponent carried the antagonism so far as to throw a bomb through his window.

VINDICATION OF COTTON MATHER AND DOCTOR BOYLSTON

But the facts could not be denied. Boylston lost only one patient in forty-eight; the normal ravages of smallpox took one in every seven. The pioneer had finally, by his persistence, vindicated himself, and the storm of condemnation was turned into a hymn of praise. In London he was honored and made a member of the Royal Society. Back in America he retired, secure in fame and fortune.

YELLOW FEVER

Another scourge of the colonies which modern science is banishing from the world was yellow fever. Appearing first in 1647 as the Barbadoes distemper, its epidemics made heavy inroads on the colonists. Quarantines were established, but nevertheless disastrous waves swept over Charlestown and Philadelphia in 1699. Concerning its effects, the Journal of Thomas Story says: "Great was the fear that fell upon all flesh. I saw no lofty or airy countenances, nor heard any vain jesting; but every face gathered paleness, and many hearts were humbled." In 1702 a fearful epidemic in New York drove the Assembly to Long Island, and subsequently it swept various parts of the country at various times.

OTHER DISEASES

But it is wearisome to list the gamut of colonial afflictions. Measles, scarlet fever, diphtheria, dysentery, influenza, and all the rest of the dread horde came and conquered their thousands and slew their ten thousands.

IN THE COLONIAL PERIOD, AMERICA WAS IN THE BACKWASH OF SCIENTIFIC ENDEAVOR

At the beginning of the colonial experience, America scientifically was in the backwash of a world that had hardly broken the shackles of the Age of Faith, and laid her ideas and theories on the altar of scientific procedure. Science can come only when the pioneer has put away his gun and escaped from the plowshare; hence the New World was necessarily far behind the most advanced notions of the day, and constrained to struggle with the decadent theories and rule-of-thumb methods that were being discredited in the centers of civilization. In Europe some of medicine's most brilliant students lived in the sixteenth and seventeenth centuries—one has but to mention Harvey, who discovered the circulation of the blood; but it was impossible that the barber-surgeons, the bone setters, the "practitioners of physick," as well as the parish preacher-doctor and the jack-of-all-trades who served as medical adviser, should have incorporated into their work many new things in science.

GRECIAN CONCEPT OF FOUR ELEMENTS IN THE HUMAN BODY

There still lingered in the popular mind the old notion, handed down from the Greeks, that the human body consisted of four elements, earth, air, fire, and water. In the body were to be found four humors or liquids, bile or choler, blood, melancholy or black bile, and phlegm. Anne Bradstreet (1612-1672), one of the first of New England's poets, expressed this belief in these verses:

> But first they showed their high descent,
> Each eldest daughter to each element;
> Choler was owned by Fire and Blood by Air,
> Earth knew her black swarth child, and Water her fair.

OTHER VAGARIES

Disease, it was commonly believed, came from an excess of one or another of the humors, or from excessive heat or cold or moisture or dryness. It was estimated by one writer in 1603 that eighty thousand diseases could be produced in this manner.

Such a system of thought was responsible for the building up of an elaborate system of drastic cathartics, made drastic because of the necessity for evacuating those humors which "had a depraved way of going wrong and sending up poisonous vapors to the brain, to the injury of those imaginary 'animal spirits.'" The various medicines used were thought to act specifically on the different humors. One type was necessary for phlegm; quite another was needed to dispel the black bile that weighed on the spirits of a hypochondriac.

DOCTRINE OF SIGNATURES

A second strange theory that also had come down through the ages, and which colored professional and lay thought, was the old Doctrine of Signatures. This doctrine was a part of the supernaturalism of the time and an outgrowth of the homocentric conception of the universe. Things had value only in their relation to man. The world was one great pharmacy and God had placed on each substance some cryptic signature to indicate the disease for which it was good. Man's duty was to decipher this label by noting color, odor, form, and other marks. "Like by like is to be cured—that is, similar ulcers by similar forms," said Paracelsus, the renovator of the Doctrine in the Middle Ages. For example, the porus leaves of St. John's-wort which had spots resembling perforations was of obvious value in cases of abrasion, either external or internal. Its illusory appearance of holes left no doubt of its efficacy in cases of hallucination, madness, and assaults of the devil. Such a treatment was called "curing by the assimulate," and along with it was its opposite, "contraries by contraries."

This doctrine had many expressions in America, and its influence is to be found in a number of current prescriptions and methods of healing. Some of the favorite remedies sent by Dr. John Stafford of London to Governor Winthrop of Connecticut serve to illustrate. At times Stafford gave milk as a remedy for jaundice; milk, being white, would attack the black humors. But the treatment suggested to Winthrop was of the "cure by the assimulate" type: "For the yellow Jaundise or Jaunders—Boyle a quart of sweet milke, dissolve therein as much bay-salt, or fine Sal-peter, as shall make it brackish in taste; and putting Saffron in a fine linen clout, rubb it into ye Milke, untill ye Milke be very yellow; and give it ye patient to drinke."

Another: "For paines in ye Brest or Limnes: Weare a Wilde Catts skin on ye place grieved."

STAFFORD'S "BLACK POWDER"

His great prescription, however, and also an example of the old theory, was his "black powder," to which there are many references in the early letters. It was made of toads because toads were poisonous; and since all poison drew poison to itself, this remedy was logically most effective. But because of the warts on the toads, it was to be regarded as an especially valuable treatment in smallpox and other eruption cases.

The "black powder" Stafford prepared as follows:

"In the Month of March, take toads as many as you will find alive; putt them in an earthen pott; so that it may be half full; cover it with a broad tyle or Iron plate; then overwhelme the pott so that the bottom may be uppermost; putt charcoales round about it and over it. . . . Sett it on fire and lett it burne out and extinguish of itself; when it is cold take out the toads; and in an Iron mortar pound them very well." Then came a second cooking which reduced this brown toad powder to harmless animal charcoal, but the good doctor never suspected it. "Moderate the dose," he wrote, "according to the strength of the partie." And he went on with these strange words: "Nota bene. No man can with a good Conscience take a fee or a reward before ye partie receive benefit apparent; and then he is not to demand anything, but what God shall putt into the head of the partie to give him. And he is not to refuse anything that shall be so given, for it comes from God." He closed his letter by adding, "These receipts are all experimented."

MEDICAL PROBLEM OF A "UNIVERSAL REMEDY"

The medical problem which continued to intrigue the popular fancy was the preparation of a universal remedy. From antiquity had come the story of the versatile Mithradates, King of Pontus, who, by experiments on criminals, discovered what medicaments would neutralize all poisons and put these together into his universal antidote, making finally a compound containing more than sixty-five components. Andromachus, physician to Nero, is reputed to have made a slight alteration of the prescription by adding the powdered flesh of the viper, apparently on the principle of curing like by like. During the Middle Ages it was generally called *theriac,* and was known in England usually as Venice treacle. It is interesting to note that this remedy was expelled from the British Pharmacopeia only in the middle of the eighteenth century. In America it was put up in less complicated forms occasionally, and the European viper's rôle was taken by the American rattlesnake.

The Bezoar, or Bezar, stone was another universal remedy in favorable repute. The stone is a mass of hair coated by calcareous salts, and is found in the stomachs and intestines of ruminants. Stones brought from the Orient were held in highest regard, but there arose a definitely established hierarchy in therapeutical value and price, based, obviously, on distance from America. In the East the bezoar was originally worn as an amulet; in America it was powdered for internal use. There is recorded the story of a skillful woman physician of Virginia who, in 1690, gave "pulverized oriental bezoar stone" to a man bitten by a rattlesnake. This remedy was followed by a decoction of dittany, the same in name, at least, as the remedy which Venus applied to the wounds of Aeneas.

This dittany, because of its mythological aura, was a famous "cure" for poisons, for extracting bits of wood or bone from wounds.

But in America its qualities were transferred to the indigenous pennyroyal. Captain Silas Taylor once told a meeting of the Royal Society that in 1657 he had held to the nose of an unwilling rattlesnake some leaves of "wild Pennyroyal" or dittany of Virginia, and the serpent died from its effect in half an hour.

EARLY "CURE-ALLS" IN AMERICA: "RUBILA"

Perhaps we of America find our interest most attracted by the first recorded of the cure-alls originating in America. This remedy was a concoction perfected by John Winthrop, Jr., Governor of Connecticut, and was called by him "Rubila." The ingredients of this famous compound were kept

from the public by the use of a secret code which was not deciphered until Oliver Wendell Holmes undertook the task. Some of the ingredients were "four grams of (diaphoretic) antimony with twenty grains of niter with a little salt of tin making rubila." Doctor Holmes believed something was added to redden the powder, as there are references in Winthrop's writings of rubifying or viridating his prescriptions. This was a common practice when the prescriptions appeared too much like plain sugar. The supposition that something was purposely omitted from the written prescription is justified by reference to letters published later in which Winthrop wrote to his son, Wait, that the powder he was sending was not ground enough. Wait, in writing of some rubila of his own preparation, said that it was "not enough ground," "half ground," or "grossly beaten." Elsewhere he wrote: "It is best to make it before the weather be hot." And again: "The dog dayes will not be so good to meddle with rubila in, so it must be deferred at present."

Some idea of the quality and efficacy of rubila might be gleaned from excerpts from Winthrop's correspondence: "Poor little Tome taken yesterday with a great pain in his stomach, belly, and side, like a plurettick feaver; your mother and most of the house up with him all night. He took rubila this morning and hope he is better." One might well suppose, as has been suggested, that the family had to work with him all night, tiring him down, before he could be persuaded to accept the heroic treatment. Further light is shed on this remedy in another letter. A certain Mr. Stone was ill and was advised to take rubila, but the prescriber did not find him "inclinable, though he was burthened in his stomach." From the same letter we find that Governor Newman once took rubila, "but hath not been willing to take it again, nor his wife that he should, though we persuaded and encouraged him thereunto." It is hardly astonishing that Wait Winthrop wrote that "for feaverishness and restlessness" he knew "nothing helps like rubila when there has been strength to bare it."

In still another letter, "poor little Tome's" hesitations appeared to be shared by another sufferer: "For Ashbyes extreemely sweld leggs if he would be persuaded to take rubila in such a proportion as would work with him though the fever be not over and to take it every day for som time, it would insensibly and by degrees take away both the swelling and every evill symptom; he may begin with a grain, or halfe a grain, and so increase halfe a graine every day till it begins to make him a little quamish, and then the next time decrease halfe a grain, and then keep to that proportion."

Relative to taking the medicine we have this letter:

Guilford June 22, 1655.

Sir, you were pleased to furnish my wife with more cordiall powders by John Crane for Graciana but no directions within or amongst the papers can we find; but truly one of the most needful directions is how to make her willing & apt to take it, for though it seemes very pleasant of itself yet is she grown so marvellous aukward & averse from takeing it in beer. Wherefore I would entreat you to prescribe to us the varyety of wayes in which it may be giuen so effectually; we doubt else it may doe much lesse good, being giuen by force only.

In 1667 John Davenport, pastor at New Haven, wrote that his wife was refractory in taking "pilles" and rubila. "My wife tooke out halfe of one of the papers, but could not beare the taste of it, and is discouraged from takeing any more. I perceive that some speech from yourselfe would best satisfie her, but if God's providence puttes a bar in the way, we are called to submit thereunto." But Governor Haynes was more kindly disposed. In his experience "it wrought very kindly alwaies both causing vomiting and purdginge." Samuel Gorton of Rhode Island was complimentary. "The cordiall and soveraighne powders" had affected him so that he found his body "to be little differing from that which it was before the distemper seized" upon him. He wondered consequently "that a thing so little in quantity, so little in sent, so little in taste, and so little to sence in operation, should beget and bring forth such effects."

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(To be continued)

CLINICAL NOTES AND CASE REPORTS

HELIUM AND OXYGEN MIXTURE

AN ECONOMICAL AND SIMPLE METHOD FOR ITS USE

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THE use of 80 per cent helium and 20 per cent oxygen mixture as a therapeutic gas originated with Dr. A. L. Barach. He reported his findings in the Proceedings of Society for Experimental Biology and Medicine, 32:462, 1934. Subsequently he has reported clinical studies in its use for asthma, pneumonia and cardiac failure, as well as obstructive lesions of the respiratory tract, with satisfactory results.

Its widespread use, however, has been limited, due to two facts. First of all, the apparatus was expensive and required a specially trained person to operate it; and, secondly, the helium was expired into the air, necessitating the use of such large quantities as to make the cost almost prohibitive.

On May 12, 1938, it occurred to me that I could put helium in my basal metabolism apparatus, thereby recirculating it without loss. The use of helium and oxygen mixtures for divers demonstrated clearly that the helium was inert. Using it, therefore, in the closed system of any basal metabolism apparatus having a gas capacity over two liters the helium would remain in the system theoretically with no loss. As a matter of fact, if the patient removes the mask at the end of inspiration there is a loss, but a $3.75 tank of helium will last over a period of many months. I leave in the soda lime and add one part of oxygen for each four parts of helium, and substitute an ordinary anesthetic mask for the usual basal metabolism nose-gag and mouthpiece. In this way the patient, unaided, may use the apparatus when, if,